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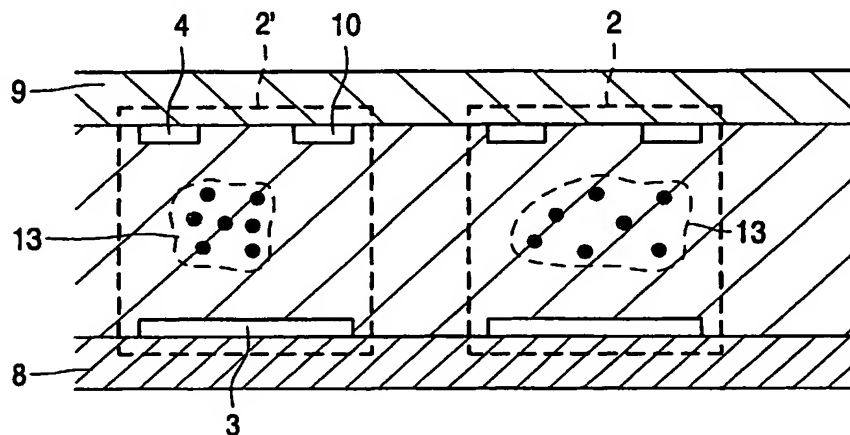
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[Continued on next page]

(54) Title: ELECTROPHORETIC DISPLAY PANEL



(57) Abstract: The electrophoretic display panel for displaying a picture and a subsequent picture, has a first and a second opposed substrate (8,9), an electrophoretic medium between the substrates (8,9), a plurality of pixels (2), a first, a second and a third electrode (3,4,10) associated with each pixel (2) and drive means. The electrophoretic medium has first charged particles having a first color. The drive means are able to control a first, a second and a third potential on the first, the second and the third electrode (3,4,10), respectively, to have picture potential values for displaying the picture, subsequently to have interval potential values before having subsequent picture potential values for displaying the subsequent picture. For the display panel to have pixels (2) with reproducible appearances, the drive means are able to apply reset potential values to the electrodes (3,4,10) as the interval potential values for bringing the charged particles into a predetermined reset position (13) between displaying the picture and displaying the subsequent picture.



TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW, ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG)

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*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

# INTERNATIONAL SEARCH REPORT

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**A. CLASSIFICATION OF SUBJECT MATTER**  
IPC 7 G02F1/167 G09G3/34

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)  
IPC 7 G02F G09G

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ, INSPEC, COMPENDEX, IBM-TDB

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4 203 106 A (DALISA ANDREW L ET AL) 13 May 1980 (1980-05-13) column 3, line 52 -column 8, line 36; figures 1-8	1-5
X	WO 94 16427 A (COPYTELE INC) 21 July 1994 (1994-07-21) page 6, line 27 -page 9, line 24; figures 1-4	1-5

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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## INTERNATIONAL SEARCH REPORT

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Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 4203106	A	13-05-1980	CA 1118876 A1	23-02-1982
			DE 2861794 D1	24-06-1982
			EP 0002094 A2	30-05-1979
			JP 1351103 C	28-11-1986
			JP 54085699 A	07-07-1979
			JP 61016074 B	28-04-1986
<hr/>				
WO 9416427	A	21-07-1994	US 5345251 A	06-09-1994
			CA 2153143 A1	21-07-1994
			DE 69418027 D1	27-05-1999
			DE 69418027 T2	25-11-1999
			EP 0679284 A1	02-11-1995
			JP 2740048 B2	15-04-1998
			JP 8507154 T	30-07-1996
			WO 9416427 A1	21-07-1994